

## NEW RECORDS OF PREDACEOUS DIVING BEETLES (COLEOPTERA: DYTISCIDAE) IN MAINE<sup>1</sup>

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**ABSTRACT:** Locations, habitat descriptions, and collection dates are listed for new records of 4 genera and 12 species of predaceous diving beetles (Coleoptera: Dytiscidae) in Maine. Previously, 17 genera and 53 species of the aquatic beetle family Dytiscidae were reported from Maine.

The family Dytiscidae, the largest family of aquatic beetles in Maine, is represented by records of 17 genera and 53 species. Thirty-three species were recorded during the Biological Survey of the Mount Desert Region (Procter 1946). A survey by Malcolm (1971) yielded another 10 species, and the remaining records were obtained from Larson (1989), Zimmerman and Smith (1975), Anderson (1971), Young (1963, 1954), Mairs (1957), Hatch (1928), and Fall (1922). Our review of Dytiscidae specimens in the University of Maine Insect Collection and in ~2,500 activity trap and 400 sweep-net samples from 2 recent studies in Maine has identified new records of 4 genera (*Agabetes*, *Hydrovatus*, *Matus*, *Neoscutopterus*), and new records of 12 species (*Agabetes acuductus*, *Acilius mediatu*s, *A. sylvanus*, *Agabus erichsoni*, *A. phaeopterus*, *A. semipunctatus*, *Graphoderus perplexus*, *Hydaticus aruspex*, *Hydrovatus pustulatus*, *Matus ovatus*, *Neoscutopterus angustus*, and *Rhantus consimilis*). We deposited voucher specimens in the University of Maine Insect Collection. Because more than twice as many species of Dytiscidae have been found in other states (e.g., 143 in Wisconsin, W. L. Hilsenhoff, pers. commun.) and forty other species of Dytiscidae have been collected from states and provinces near Maine, additional new records certainly will be found in Maine.

**Format:** The sequence of information is consistent within categories (e.g., Specimen(s) collected): information for 2 ponds or 2 collection points within a pond is separated by 'and', information for >2 ponds or >2 collection points within a pond is presented as a range (e.g., 2-5 refers to 2 through 5); ? = unknown.

Specimen(s) collected — number, gender, life stage

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Location(s) — general directions, specific x and y Universal Transverse Mercator (UTM) coordinates for pond(s) {(e.g., a) pond 1 and b) pond 2; for >2 ponds an area description without specific coordinates}

Habitat(s) — type; pH is *in situ* unless stated as equilibrated (eq) pH; specific conductance; (these data are for the pond); water depth; vegetation, (these data are for collection point(s) within pond(s) unless noted otherwise)

Date(s) collected — day/month/year

Identification key — reference(s)

#### *AGABETES* Crotch

##### *A. aceductus* (Harris)

Specimens collected — 5 ♀, 2 ♂ adults

Location — Massabesic Experimental Forest, Tatnic and Welch Hills area, and Cutts Island, York Co., USGS Quad. Maps - Alfred, North Berwick, and Kittery; UTM's ?

Habitat — Vernal pools; pH 4.5-5.7, specific conductance, 10-40  $\mu\text{mhos cm}^{-1}$ , water depths (at deepest points in pools) 14.5-90 cm; vegetation ?

Dates collected — 19 Apr 95-30 May 95

Identification key — Peckarsky *et al.* (1990) to monotypic genus

#### *ACILIUS* Leach

##### *A. mediatius* (Say)

Specimen collected — 1 ♀ adult

Location — Pettingill Brook near Coffin Road, 6.5 km w. of Washburn, Aroostook Co., USGS Quad. Map - Caribou, UTM's; x571750, y518050

Habitat — Beaver flowage; eqpH 8.42; specific conductance, 294  $\mu\text{mhos cm}^{-1}$ ; water depth, 20 cm; vegetation, 35% grass (Gramineae) and 15% speckled alder (*Alnus incana*)

Date collected — 8 Jul 93

Identification key — Hilsenhoff (1993)

##### *A. sylvanus* Hilsenhoff

Specimens collected — 4 ♀, 6 ♂ adults

Location — E. of Chaney Woods Rd., ? km. ? of Wells, York Co., USGS Quad. Map - North Berwick, UTM's ?

Habitat — Vernal pool; pH 5.3, specific conductance, 40  $\mu\text{mhos cm}^{-1}$ ; water depth (at deepest point in pool) 55 cm; vegetation, ?

Date collected — 08 July 1994

Identification key — Hilsenhoff (1993)

#### *AGABUS* Leach

##### *A. erichsoni* Gemminger and Harold

Specimens collected — 6 ♀, 3 ♂ adults

Location — Intersection of Moore Brook and Hardison Road, Caribou, Aroostook Co., USGS Quad. Map - Goodwin, UTM's; x580500, y518475

Habitat — Vernal pool; eqpH 8.04; specific conductance, 275  $\mu\text{mhos cm}^{-1}$ ; water depths, 13-17 cm; vegetation, 85% ash (*Fraxinus* sp.) canopy with 15% emergent grass (Gramineae)

Dates collected — 16 Jun 93, 8 Jul 93

Identification key — Larson (1989)

**A. phaeopterus** (Kirby)

Specimens collected — 13 ♀, 15 ♂ adults

Location — Throughout a 2,500 km<sup>2</sup> area around Presque Isle, Aroostook Co.Habitats — a) Beaver flowages; eqpH 6.49- 8.54; specific conductance, 19.7- 337  $\mu\text{mhos cm}^{-1}$ ; water depths, 13- 30 cm; vegetation, *Sphagnum* spp., *Scirpus* spp., *Carex* spp., and b) vernal pool; eqpH 8.04; specific conductance, 275  $\mu\text{mhos cm}^{-1}$ ; water depths, 13-17 cm; vegetation, 85% ash (*Fraxinus* sp.) canopy with 15% emergent grass (Gramineae)

Dates collected — a) 16 Jun 93, 8 Jul 93; b) 8 Jul 93

Identification key — Larson (1989)

**A. semipunctatus** (Kirby)

Specimens collected — 2 ♀, 1 ♂ adults

Locations — a) Ashland, Aroostook Co., USGS Quad. Maps - York Ridge, UTM's; x547900, y517480; and b) Bridgewater, Aroostook Co., USGS Quad. Maps - Echo Lake. UTM's; x576775, y515050

Habitats — a) Beaver flowage, eqpH 8.02; specific conductance, 63.3  $\mu\text{mhos cm}^{-1}$ ; water depth, 19 cm; vegetation, 40% sedge (Cyperaceae) with 15% *Spiraea latifolia*; and b) beaver flowage; eqpH 7.71, specific conductance, 40.6  $\mu\text{mhos cm}^{-1}$ ; water depth, 42 cm, vegetation, 60% rush (Juncaceae) with 10% sedge (Cyperaceae)

Dates collected — a) 8 Jul 93; b) 27 May 93

Identification key — Larson (1989)

**GRAPHODERUS** Dejean**G. perplexus** Sharp

Specimens collected — 2 ♂ adults

Locations — a) Ginn Brook 6.5 km w. of Fort Fairfield following Marshall Currier Rd., Aroostook Co., USGS Quad. Map - Goodwin, UTM's; x581400, y517865; and b) Hammond Brook 6.5 km s. of Van Buren, Aroostook Co., USGS Quad. Map - Doyle Ridge, UTM's; x579500, y521250

Habitats — a) Beaver flowage; eqpH 8.56; specific conductance, 309  $\mu\text{mhos cm}^{-1}$ , water depth, 45 cm vegetation, 60% *Typha latifolia*; and b) sedge meadow; eqpH 5.93; specific conductance, 13.1  $\mu\text{mhos cm}^{-1}$ ; water depth, 73 cm; vegetation, 10-60% *Scirpus cyperinus* and *Carex rostrata*

Dates collected — 8 Jul 93, 22 Jun 94

Identification key — Hilsenhoff (1993)

**HYDATIUS** Leach**H. aruspex** Clark

Specimens collected — 23 ♀, 20 ♂ adults

Location — Throughout a 2,500 km<sup>2</sup> area around Presque Isle, Aroostook Co.Habitats — a) Beaver flowages; eqpH 6.49-8.56; specific conductance, 19.7-337  $\mu\text{mhos cm}^{-1}$ ; water depths, 13-37 cm; vegetation, *Sphagnum* spp., *Scirpus* spp., *Carex* spp.; and b) vernal pool; eqpH 8.04; specific conductance, 275  $\mu\text{mhos cm}^{-1}$ ; water depths, 13-17 cm; vegetation, 85% Ash (*Fraxinus* sp.) canopy with 15% emergent grass (Gramineae)

Dates collected — a) 27 May 93 - 8 Jul 93; b) 8 Jul 93

Identification key — Roughley and Pengelly (1982)

*HYDROVATUS* Motschulsky*H. pustulatus* (Melsheimer)

- Specimen collected — 1 ♀ adult  
 Location — Norway, Oxford Co.; USGS Quad. Map ?, UTM's ?  
 Habitat — ?  
 Date collected — 3 Sep 69  
 Identification key — Young (1963)

*MATUS* Aubé*M. ovatus ovatus* Leech

- Specimens collected — 1 ♀, 5 ♂ adults  
 Locations — a) Upland forest w. of Old County Rd. between Chicks Brook and Ogunquit River, South Berwick, York Co., USGS Quad. Map - York Harbor, UTM's ?, and b) upland forest of Cutts Island, Kittery, York Co., USGS Quad. Map - Kittery, UTM's ?  
 Habitats — a) Vernal pool; pH 4.7; specific conductance, 37  $\mu\text{mhos cm}^{-1}$ ; water depth (at deepest point in pool) 34 cm; vegetation, ?; and b) vernal pools; pH 5.6-5.9; specific conductance, 67  $\mu\text{mhos cm}^{-1}$ ; water depths (at deepest point in pools) 35-87 cm; vegetation, ?  
 Dates collected — a) (6 Jul 94; b) 14 Jun 94, 9 Jul 94  
 Identification key — Young (1953)

*NEOSCUPTERUS* Balfour-Browne*N. angustus* (LeConte)

- Specimen collected — 1 ♂ adult  
 Location — Moosehead Lake, Piscataquis Co.; USGS Quad. Map ?, UTM's ?  
 Habitat — ?  
 Date collected — ? Sep 68  
 Identification key — Larson (1975)

*RHANTUS* Dejean*R. consimilis* Motschulsky

- Specimens collected - 1 ♀, 3 ♂ adults  
 Location — Intersection of Moore Brook and Hardison Road, Caribou, Aroostook Co., USGS Quad. Map - Goodwin, UTM's; x580500, y518475  
 Habitat — Vernal pool; eqpH 8.04; specific conductance, 275  $\mu\text{mhos cm}^{-1}$ , water depths, 20-48 cm, vegetation, 15-60% grass (Gramineae), *Scirpus* spp., *Carex* spp. and horsetail (*Equisetum* sp. ); one half of the sites contained 10 to 15% sweetgale (*Myrica gale*)  
 Dates collected — 27 May 93, 8 Jul 93  
 Identification key — Zimmerman and Smith (1975)

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